ASSIGNMENT 1

Textbook Assignment: "Construction Methods and Materials: Heavy Construction," chapter 1, pages 1-1 through 1-28.

Learning Objective: Identify the different components of a bridge and describe how those components are used.

1-1. In the Naval Construction Force (NCF), to what does the term "heavy construction" refer?

1. A project in which extra-heavy structural members are used
2. A project in which large bulks of materials are used
3. Bridge or waterfront construction
4. Each of the above

1-2. A bridge having only one intermediate support is referred to as a/an

1. single span
2. intermediate span
3. multispan
4. double span

A. Substructure

B. Abutment

C. Sill

D. Footing

E. Corbel

F. Pier

Figure 1A

IN ANSWERING QUESTIONS 1-3 THROUGH 1-7, SELECT FROM FIGURE 1A THE TERM THAT IS BEST DEFINED BY THE QUESTION.

1-3. That part of an overall bridge structure that transmits the combined live and dead loads directly to the earth foundation.

1. A
2. B
3. C
4. D

1-4. The aggregate total of all bridge components located below the stringers.

1. A
2. B
3. E
4. F

1-5. A type of structural framework that includes two or more rows of posts or piles.

1. B
2. C
3. E
4. F

1-6. One of two supports located at the ends of a bridge superstructure.

1. B
2. C
3. D
4. E

1-7. The part of a timber-sill abutment that carries the loads imposed by the stringers.

1. A
2. C
3. D
4. E

1-8. Which of the following components is NOT a part of the flooring system of a bridge?

1. Curb
2. Deck
3. Stringers
4. Handrails

1-9. What structural member(s) of a bridge carry(ies) only the live load of the traffic plus the dead load of the flooring?

1. Abutment sill
2. Pile or post caps
3. Stringers
4. Corbels

Learning Objective: Describe the terminology, methods, and materials used in foundation and pile construction.

1-10. Which, if any, of the following characteristics is common to both foundations and piles?

1. Both are always constructed of reinforced concrete
2. Both distribute the total weight of a building or structure to the natural earth
3. Both are used to resist only a vertically applied load
4. None of the above

1-11. What element of a foundation ultimately carries the total dead and live loads imposed by a building or structure?

1. Foundation bed
2. Foundation wall
3. Footing

1-12. A structural engineer is preparing to design the foundation for a large building that is to be built on a site known to have uneven subsoil conditions. What type of foundation can the engineer design that will minimize the possible effects of this condition?

1. Continuous
2. Spread
3. Grade beam
4. Mat

1-13. The larger end of a tapered precast concrete pile is its

1. butt
2. tip
3. shank
4. closed end

1-14. What type of piles should you specify for use in preventing the walls of a trench from caving in?

1. Bearing
2. Sheet
3. Batter
4. H

1-15. To join the edges of concrete sheet piles, in what form or shape are the edges cast?

1. Deep
2. Arch
3. Interlock
4. Tongue and groove

Learning Objective: Identify types of waterfront structures and their uses.

1-16. In which of the following ways are a breakwater and a jetty both (a) similar and (b) different?

1. (a) Both are used to direct the current flow in a channel (b) a breakwater is an alongshore structure
2. (a) Both are alongshore structures used to break the action of waves (b) a jetty has a paved top for vehicular traffic
3. (a) Both are offshore structures used to break the action of waves (b) a jetty directs the current flow along the line of a channel
4. (a) Both are harbor-shelter structures (b) a breakwater extends out from the shoreline

1-17. To establish a definite shoreline and maintain it against wave erosion, what type of structure should the engineer design?

1. Seawall
2. Breakwater
3. Jetty
4. Groin

1-18. To allow ships to lie alongside for loading and unloading, what type of structure should be used?

1. Wharfage
2. Offshore
3. Stable shoreline
4. Mole

1-19. In which of the following conditions can a concrete cap structure be used on a breakwater or jetty?

1. Deep-water site only
2. Extra-high tide range only
3. Deep-water site or extra-high tide range
4. Shallow-water site

1-20. How are the individual units of a precast cap structure for a breakwater (a) taken to and (b) placed in their proper location?

1. (a) Floated (b) sunk
2. (a) Carried (b) driven
3. (a) Craned (b) dropped
4. (a) Barged (b) unloaded

1-21. In which of the following uays are a seawall and a bulkhead both (a) similar and (b) different?

1. (a) Both protect a shoreline against erosion (b) a bulkhead is supported by its own weight
2. (a) Both protect a shoreline against erosion (b) a bulkhead is relatively thin and usually consists of steel sheet piles
3. (a) Both are relatively thin and self-contained (b) bulkheads are normally cast-in-place concrete structures
4. (a) Both are relatively thick and self-contained (b) a bulkhead can be constructed using wooden sheet piles

1-22. To allow ships to come alongside, bulkheads are fitted with

1. wales and anchors
2. piles and quays
3. timber caps and batter fenders
4. mooring cleats and dolphins

1-23. In what way, if any, does the purpose of a dolphin differ from that of a pile cluster?

1. Dolphins are used to protect a pier, while pile clusters protect offshore structures
2. Dolphins are used to protect moles, while pile clusters protect groins
3. Dolphins are used to protect ships only, while pile clusters protect piers only
4. None. They are both used as protection for both piers and ships

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Learnning Objective: Describe the types of fasteners and connectors used in heavy-timber construction.

1-24. What type of heavy-timber fastener has square heads and nuts?

1. Pin
2. Bolt
3. Spike
4. Rail

1-25. In timber construction, what is the minimum spacing, in inches, between bolts?

1. 9
2. 7
3. 3 1/2
4. 1 1/2

1-26. A timber fastener that is used primarily to prevent one member from moving laterally in relation-ship to another is called a

1. lag bolt
2. driftbolt
3. cleat
4. dowel

1-27. A short length of timber that is spiked or bolted to the adjoining members of a joint is a

1. connector
2. scab
3. cleat
4. block

1-28. What is the general term applied to the variety of devices used in bolted-lap joints between heavy timbers?

1. Driftpins
2. Spike grids
3. Expansion bolts
4. Timber connectors

1-29. What type of connector is embedded in circular grooves in the faces of the timbers being jointed?

1. Spike grid
2. Toothed ring
3. Split ring
4. Shear plate

1-30. Which, if any, of the following rings is/are are embedded by pressure?

1. Toothed ring only
2. Spike grid only
3. Toothed ring and spike grid
4. None of the above

Learning Objective: Identify different structural steel shapes and their uses.

1-31. What standard structural shape is most commonly used for columns?

1. C
2. HP
3. S
4. W

1-32. For what reason does the W-shape provide greater strength than the S-shape?

1. Its flanges have a greater cross-sectional area
2. Its web has a greater cross-sectional area
3. The inner faces of its flanges are tapered towards the web
4. The width of the flanges is always much greater than those of the S-shape

1-33. What does the structural-steel designation “W14 x 74” signify?

1. A W-shape member that is 74 inches long with 14-inch-wide flanges
2. A W-shape member that is 74 feet long with a 14-inch-deep web
3. A W-shape member with a 14-inch-deep web and a weight of 74 pounds per linear foot
4. A W-shape member that weighs 14 pounds per linear foot and is 74 feet long

1-34. In what way does an HP-shape member differ from a correspondingly sized M-shape structural steel member?

1. The width of its flanges are slightly larger
2. It has a greater cross-sectional area overall
3. Its flanges have a greater cross-sectional area only
4. Its web has a greater cross-sectional area only

1-35. The S-shape structural steels have a cross section shaped like what letter?

1. C
2. I
3. S
4. W

1-36. What is the symbol used for an American Standard channel?

1. SC
2. MC
3. C
4. [

1-37. A structural steel shape whose cross section resembles the letter L is a/an

1. bar
2. angle
3. tee
4. plate

1-38. In the designation of a structural steel angle having unequal legs, what dimsnsion should you list first?

1. Wider leg
2. Narrow leg
3. Thickness
4. Length

1-39. A flat structural steel shape having a cross section that measures 6 1/2 inches by 3/4 Inches is called

1. steel plate
2. sheet metal
3. bar

1-40. A 40-pound plate is the same as a

1. 1-inch plate
2. 2-inch plate
3. 1 1/2-inch plate
4. 2 1/2-inch plate

1-41. What structural shape should you specify for bracing and connecting heavy structural msmbers?

1. S-shape
2. C-shape
3. Angle
4. Flat or round bar

Learning Objective: Describe differing steel construction methods used for steel frame structures.

1-42. The processing of raw materials to form finished members of steel structures is called

1. election
2. manufacturing
3. prefabrication
4. fabrication

1-43. The rigging and hoisting of steel members to their proper places in a steel structure is part of what process?

1. Fabrication
2. Erection
3. Construction
4. Prefabrication

1-44. What method of steel construction uses masonry walls to support structural floor- and roof-framing members?

1. Skeleton
2. Long span
3. Wall bearing

1-45. Built-up girders, trusses, and bar joists are all commonly used in what method of steel construction?

1. Skeleton
2. Long span
3. Wall bearing

1-46. Horizontal structural members connecting the exterior columns of a skeleton structure are called

1. lintels
2. girders
3. floor beams
4. spandrel beams

1-47. In skeleton construction, by what means can the size of a structure be enlarged to provide additional floor space?

1. Add additional columns only
2. Add additional beams only
3. Add additional columns, beans, and girders
4. Add additional columns and beams only

1-46. A vehicle passes over a steel-truss bridge. In what order is the imposed loading from the truck transmitted through the bridge members to the supporting abutments?

1. Decking, stringers, transverse beams, trusses, end pedestals, bearing plates
2. Decking, trusses, stringers, transverse beams, bearing plates, end pedestals
3. Trusses, decking, transverse beams, stringers, end pedestals, bearing plates
4. Trusses, transverse beams, decking, stringers, end pedestals, bearing plates

1-49. Which of the following reasons is an advantage of preengineered metal structures?

1. They can be quickly erected
2. The individual members or components are factory-built
3. They are chipped as complete kits
4. Each of the above

Learning Objective: Identify common connectors used in steel frame structures.

1-50. In the military, what connectors are most comnonly used for steel construction?

1. Pins and welds
2. Pins and rivets
3. Bolts and welds
4. Rivets and bolts

1-51. What type of connector is used at the ends of bracing rods or where freedom of rotation is required?

1. Bolt
2. Pin
3. Weld
4. Rivet

1-52. In steel building construction, what type of connector is used more that any other type?

1. Weld
2. Bolt
3. Pin
4. Rivet

1-53. When bolts are used, how does the hole size compare to the nominal bolt size?

1. Half-size larger
2. Same size
3. Slightly smaller
4. Slightly larger

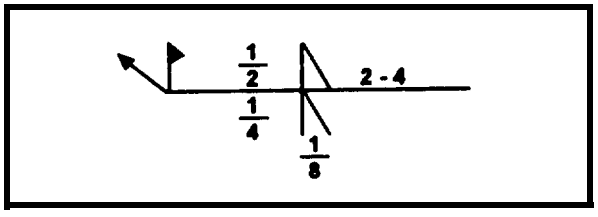

Figure 1B

IN ANSWERING QUESTIONS 1-54 THROUGH 1-56, REFER TO FIGURE 1B.

1-54. What type and size of weld is to be made on the “other side”?

1. 1/4-inch bevel weld
2. 1/4-inch vee weld
3. 1/2-inch fillet weld
4. 1/2-inch bevel weld

1-55. What does the numeral 4 mean?

1. The length of the weld in inches
2. The length of the weld in millimeter
3. The center-to-center spacing of the weld in inches
4. The center-to-center spacing of the weld in millimeters

1-56. What does the small flag shown in the symbol indicate?

1. The “other side” weld only is to be made in the shop
2. The “arrow side” weld only is to be made in the field
3. Both the “other side” and “arrow side” welds are to be made in the shop
4. Both the “other side” and “arrow side” welds are to be made in the field

1-57. When a reference is not required, what part of a welding symbol can be omitted?

1. The arrow
2. The reference line
3. The tail
4. The detail reference symbol

1-58. For structural work, the diameter of rivets most often used are

1. 1 and 1 1/4 inches
2. 3/4 and 7/8 inch
3. 1/2 and 5/8 inch
4. 1/4 and 3/8 inch

1-59. For a 1-inch-diameter rivet, what size hole should be drilled?

1. 1 inch
2. 1 1/16 inches
3. 1 3/16 inches
4. 1 1/4 inches

1-60. For structural steework, rivets are manufactured from what type of material?

1. Iron
2. Hard steel
3. Soft steel
4. Aluminum